[11150/45]

METHOD AND DEVICE FOR ACTIVELY ASSISTING A MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE

The present invention relates to a method and a device for implementing the method of actively assisting a motor vehicle driver in a motor vehicle.

Motor vehicles represent an overall system, which is becoming increasingly complex and, on one hand, offers a motor vehicle driver more and more comfort options and, on the other hand, is provided with an increasing number of safety-related systems. However, these safety-related systems must be monitored with regard to their functionality. In the case of a defect or a condition that is critical for the vehicle, a motor vehicle driver often does not know how he or she should react to such an error message indicated, for example, by a lit-up LED. In addition, it is difficult for most motor vehicle drivers to remember how to correctly operate all of the comfort systems, such as navigation, engine-independent heating systems, air conditioning, seat adjusters, mirror adjusting systems, telephone, audio, etc. This results in a multitude of comfort options, which would otherwise be used, not being used at all. In addition, the existing displays only show the motor vehicle driver the actual states, such as "the tank is empty", "inspection interval elapsed", or "for safety reasons, television only during standstill".

Therefore the present invention is based on the engineering problem of providing a method and a device for actively assisting a motor vehicle driver in a motor vehicle, which prevent the problems described above.

The solution to the engineering problem is given by the subject matters having the features of Claims 1 and 6.

Additional advantageous embodiments of the present invention are derived from the dependent claims.

To this end, the control unit and an input and display unit automatically assist in the communication between the motor vehicle driver and the vehicle. In order to assist the motor vehicle driver, he or she is offered context- and/or preference-sensitive input options, which are automatically implemented after being selected by the motor vehicle driver.

In a preferred embodiment, a control unit monitors the conditions of the vehicle and displays these on a display unit, together with possible actions. The action selected by the motor vehicle driver is then automatically executed by the device. If the control unit detects, for example, that the engine temperature has exceeded its permissible value, then this is automatically represented on the display unit. In addition, the possible actions such as "shut off engine", "call nearest garage", or "ignore" are represented on the display unit. If the motor vehicle driver selects the action "shut off engine", then the device automatically switches off the engine. If, however, the motor vehicle driver selects the action "call nearest garage", then the device uses the data of a navigation device to search for the next service station, and uses a car-phone system to automatically dial the number of the service station. Therefore, the method is not only used to display the critical conditions to the motor vehicle driver, but also to display the appropriate countermeasures, which are then actively supported, as well. To this end, the individual countermeasures are preferably stored in a situation-specific manner in a memory assigned to the control unit. Examples of other critical vehicle conditions include the engine-oil level.

The motor vehicle driver may also be actively assisted in the adjustment of comfort components. For this purpose, the control unit is connected to the corresponding comfort

devices. After the motor vehicle driver has manually activated the method, the possible comfort systems are initially represented on the display unit, from which the motor vehicle driver can then select the desired comfort components. In addition, it should be noted that, in this case, manual activation is to be understood as the opposite of automatic activation and therefore includes activation by voice command, as well. After the motor vehicle driver has selected the desired comfort components, the display unit displays which changes can be made and how they can be carried out. In this context, the display occurs in a context-sensitive manner, i.e. only information relevant for the adjustments is displayed.

If the display unit is designed as a touch screen, then the corresponding control elements can be ordered in a context-sensitive manner and displayed on the display unit.

The motor vehicle driver can receive further, active assistance from recommendations such as eating, resting, refueling, parking, or spending the night. To this end, the motor vehicle driver manually activates the method again and selects from a suggestion list the recommendations he would like to receive. Access to the data of a navigation system allows a list of possible suggestions to be compiled, driver preferences possibly being considered. In the individual recommendations, the motor vehicle driver can have details displayed for him and, after selecting a recommendation, he can be navigated to what is recommended or make an order, in which case the number may be automatically dialed.

Of course, the individual methods can also be combined, i.e. one can simultaneously intervene in comfort components and vehicle-condition components. If, for example, the motor vehicle driver selects a television mounted in the vehicle, while driving, then the driver is informed, on one hand, that this is not permissible while driving. In addition, the

warning is immediately followed by an inquiry as to whether a possibility for parking should be sought after. If the motor vehicle driver answers this in the affirmative, then the system searches for the next parking possibility with the aid of a navigation system, and navigates the motor vehicle driver to it. Preparatory adjustments, such as the selection of a station, can already be checked and carried out parallelly to navigating. If the motor vehicle was navigated to the parking spot, the motor vehicle driver is asked if the engine should be shut off, which may then be automatically executed by the system.

The present invention is explained below in detail, using a preferred exemplary embodiment. The figures show:

Fig. 1 a display on a display unit, after the method has been activated;

Fig. 2 a display on the display unit, after the driver has input a request for recommendations;

Fig. 3 a display of a hit list;

Fig. 4 a detailed display of a hit;

Fig. 5 a display of the hits on a digital map; and

Fig. 6 a display of an automatically displayed, critical vehicle condition.

The method for actively assisting a motor vehicle driver in a motor vehicle is assigned an activation field 1, which is always situated at the same position on display unit 5, which takes the form of a touch screen. If this activation field 1 is activated, then a control unit not shown changes the current display on display unit 5 and generates a first input menu 6 on display unit 5. This input menu 6 includes a marking indicating that the method is activated, in which the name of the function, for example "BUTLER", is made visible, the upper edge of input menu 6 also being rounded off. Furthermore, input menu 6 includes three input fields 2, on which the selection options are alphanumerically displayed.

In this context, the user may select among the input options "recommendations", "help", and "repeat status message", input fields 2 being designed as touch fields. Alternatively, or in addition, the input may be accomplished by voice command and/or using a bidirectional, rotary pressure transducer, which, for example, is described in EP 366 132 B1. If input option 2a, "recommendations", is now selected, the control unit generates a display according to Fig. 2.

In this case, input menu 6 from Fig. 1 has been moved up on display unit 5. A menu 7 of the areas, for which the method can give the user recommendations, in this case "eating", "resting", "refueling", "parking", and "lodging", is then displayed under the input menu. The fields of menu 7 are designed as touch fields, as are input fields 2. If the user now selects the field, "eating", this field 7a is then displayed in color or in an optically highlighted manner. In addition, the selected field is assigned a touch-sensitive input field 8, "open", by means of which detailed information is displayable. However, the user can change to another field or another input option by touch, or discontinue the method by touching "closing field" 3. After input field 8, "open", is touched, the control unit generates a suggestion list 9, which is displayed in Fig. 3. To generate this suggestion list 9, the control unit accesses the database of a navigation system, in order to determine the current position of the motor vehicle. Using this current position as a starting point, the control unit searches through an internal and/or external restaurant database. In this context, the control unit selects restaurants located within a certain area around the current position, additional driver preferences, such as "no Japanese food", being considered. If the user would now like to obtain details on a restaurant, this restaurant is selected in suggestion list 9, and inserted field 10, "detail", is activated. An exemplary detailed display is represented in Fig. 4. If desired, the user can have the menu read out by activating input field 11, "read out". The activation of

input field 4 automatically establishes a telephone connection to the restaurant, in order, for example, to reserve a table. But if the user would like to receive data for navigating to the restaurant, then, by activating input field 12, "navigation", a digital map 13 having route guidance is displayed on display unit 5 in accordance with Fig. 5, and/or the guidance system is activated.

Represented in Fig. 6 is a display of an automatically displayed warning message 14 for a critical condition of the vehicle. The example represented here is the increased temperature of the engine oil. To this end, the control unit or sensory system responsible for the engine-oil temperature transmits a warning message to the control unit controlling display unit 5. As a result, the control unit generates a corresponding warning message 14 and displays it on display unit 5 in an optically highlighted manner. In order to perceive it in an improved manner, the warning message may be emphasized in color and/or using additional pictographs. Furthermore, additional acoustic and/or haptic warning instructions are also possible. At the same time, the control unit activates the method for active assistance, so that input menu 6 is automatically displayed with assigned input fields 2. Possibilities for action, such as how one could react to the represented, critical vehicle condition, are offered to the driver on these input fields 2. In this case, the motor vehicle driver can select among the options "shut off engine", "call garage", or "ignore". If the motor vehicle driver selects input field 2, "shut off engine", then the control unit automatically switches off the engine. In so doing, the event may be delayed in time, in order that the motor vehicle driver is able to shut off the motor vehicle at a suitable location. However, if the motor vehicle driver selects input field 2, "call garage", then the control unit automatically calls the nearest garage. When input field 2, "ignore", is selected, warning message 14 is erased accordingly.